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transition of **hard** and **soft**:
architecture for human, machine and information interchange

by

Minjung Maing

B.S. Civil Engineering

B.A. Design of the Environment

University of Pennsylvania, 1995

Author:

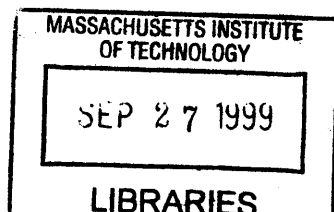
Minjung Maing
Department of Architecture
August 6, 1999

Certified by:

Wellington J. Reiter
Associate Professor of the Practice of Architecture

Accepted by: ..

Wellington J. Reiter
Associate Professor of the Practice of Architecture
Chairperson, Dept Committee on Graduate Students



ROTON

{ Thesis Committee }

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Thesis Advisor

Wellington J. Reiter
Associate Professor of the
Practice of Architecture

Readers

Takehiko Nagakura
Assistant
Professor of
Architecture.

Andrew Scott
Associate
Professor of
Architecture.

abstract

{ abstract }

Exchange is the foundation of our specie's existence; and the means of human exchange has been evolving with the fast advancing digital technology. In modern world of new and now, it is no longer simply about delayed transporting as whole the encountering parties from one point to another for the sake of that exchange. Almost instantaneous exchanges with partial displacement of human senses (mainly visual and audio, for now) needed for a meaningful human engagement occur every minute on our planet.

the new exchange

Exchange is now more than a flight across the Pacific for a business meeting, a train ride to grandpa's country cottage for the holidays, or even a drive across town on a bingo night. It now encompasses faces and voices in the form of anonymous streaming bits of data over invisible and ethereal mediums.

Transition of **hard** and **soft**:
architecture for human, machine
and information interchange

By
Minjung Maing

Architecture, as an inherently slow-moving discipline, has not been evolving commensurate to the rapidly changing conditions. Airports are still built just for plane travel, subway stations continue to be built only as stops for the trains, and department stores with huge car lots - the contemporary model of mass exchange; the "market" -- are built for no other purpose than to provide a mere setting for physical transport of the encountering persons and their goods.

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Modern human living in what may be outdated urban settings demands accessibility to multiple resources and forums in the form of hybrid architecture. Architecture that can not only incorporate the earlier outlined different modes of exchange but which is capable of fast transformation or adaptation to respond to the rapidly altering demands. Such architectural philosophy can rejuvenate the old, existing infrastructure and efficiently preclude our built environment from total obsolescence. The old, inefficient infrastructure will then be a point of departure towards an environment full of multi-level exchanges via multi-purpose complexes.

My intentions were to utilize a reworked form the most basic building element - the building skin - and new building surface concepts to arrive at such architecture.

*I have designed a core/link
of this multi-function/multi-
exchange enclosure onto a
Japanese colonial day train
station in Seoul, Korea to
illustrate my thesis.*

acknowledgements

{ acknowledgements }

Deepest thanks to:

Duke's patience and understanding - his encouraging and challenging emails were the driving force behind this thesis.

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Nancy's patience and for catching the train before it left.

and most of all

to the angel who gave me unconditional support and stood by me through these backbreaking difficulties.

my family for making sure I made the most of every day and keeping me in touch with the 'real world'.

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[EOF]

a
node
of
exchange
in
the
core
of
Seoul
Korea

I have designed a core/link of this
multi-function/multi-exchange
enclosure onto a Japanese colonial day
train station in Seoul, Korea to
illustrate my thesis.

introduction

Movement as a source and origin of both large and small scale human environment -- cities and buildings -- is more salient to a modern culture than ever before. Contemporary life of speed, devoid of character or identity, point to a static future where the destination is the only objective. All cities will look the same -- regardless of regional histories where "history" is only a cheap reference without real connections, and all buildings will feel the same. If getting from point A to point B in the utmost expeditious manner is the sole, driving philosophy of modern culture (not just in physical transportation but all aspects of human exchange), will there be a "city life" in the future as we understand and enjoy it -- at least to an extent? will it matter how we move and what we move through?



Photo taken inside Seoul Station

With the understanding of motion as the generator of urban and architectural identity, my proposal is to create a node of exchange grounded in movement; not just for the obvious physical transportation, but for life and all events of "living". It will be a celebratory space of the idea, the act and the means of human movement.

The contemporary transportation interchange is an urban gateway to a culture; my interest lies in the dynamic and static effects of the urban forces in making of an architectural place of event -- of motion, information, release to the city, connection to the limits

architecture responsive to change

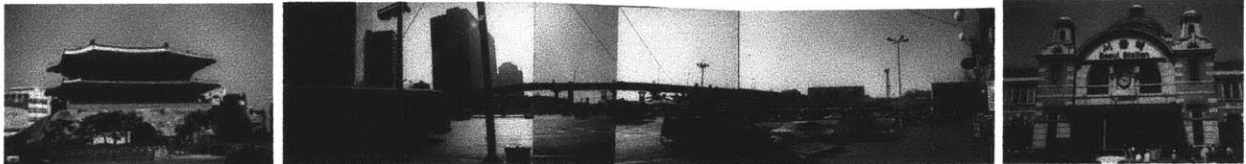
context

{ context }

.14

[**Seoul**]

is a city imbued with remnants from a long and eventful cultural past as well as rumpled reflections of a national economy bent on break-neck growth. The area around Seoul Station is typical of the many architectural faces that are frequently confronted in Seoul, from the graceful ancient gate - Nam Dae Mun - to the Japanese colonial occupation - Seoul Station - and finally to the contemporary times - imposing skyscrapers.



Photos <left to right>: Nam-Dae-Mun, panoramic view with Seoul Station to the right, and main entrance of Seoul Station

[explosion]

of population and automobile ownership in Seoul over the past 30 years, has subjected the city to major dilemmas in the organization of transportation. The quest to seek for more efficient flow of traffic has led to government-sponsored megaprojects particularly the Incheon International Airport and Kyungbu High Speed Rail (HSR). Both projects were started at similar times in the early 90s when demand for more efficient means of travel was becoming undeniable. The New International Airport, Incheon Airport is currently under construction on a large landfill between two islands west of Seoul. The TGV High Speed Rail Project, Kyung-bu HSR line routed from Seoul to Pusan is to cover a distance of 400km in less than two hours - a marked improvement from its predecessors of 4 hours. The future of Seoul was envisioned as one of rapid exchange from one source to another. These infrastructures would create terminals no longer only used in the sense of an intermediary passage or an end but a new urban center. Using a fashionable strategy, past habits and values with a digital taint are being revived to cater to people's needs.

.15

[mobility]

affects the shape of the city, through hindsight it has been observed that cities tend to form around modes of transportation. Accessibility has been essential to people, to meet the needs of their everyday lives. In our society today there is an ever growing need to move from one place to another rapidly and efficiently. Information technology has entirely altered the way people conduct their lives by providing instantaneous communication channels - the internet web services providing updated information, downloadable information, email, mobile faxes, cellular services. Recalling the past few decades however, human transportability has not been able to depart from the traditional forms of automobiles, trains, and airplanes. The birth and growth of internet/information related activities has outpaced the development in supporting infrastructure which has been far too slow even while under heavy scrutiny.

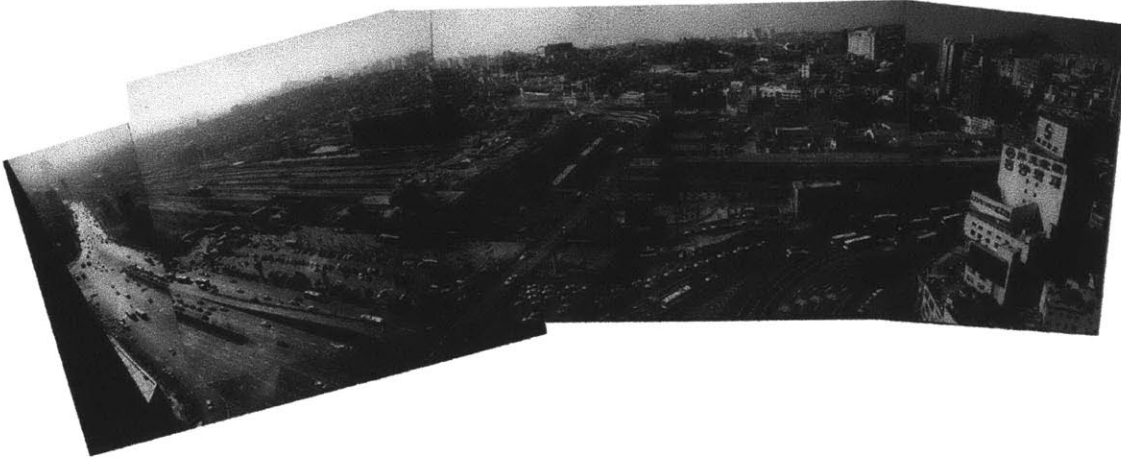


[multimedia]

has opened our eyes to a new way of living. We no longer are faced with limited choices, the "wide" web has brought a new culture where people search for their answers. The quest for knowledge has created a society hungry for knowledge and choice with anonymity. The concept of the internet has spread to many different disciplines, and architecture cannot pretend to be untainted by this major social change. Information has become the hot commodity. Trading become a common part of life demands for up-to-the-minute trading information- stock quotes, currency exchange rates and international market outlooks. Entertainment, a keen player loyally follows the movements of the digital age. The resources are vastly expanding making this network of information retrieval an irresistible source.



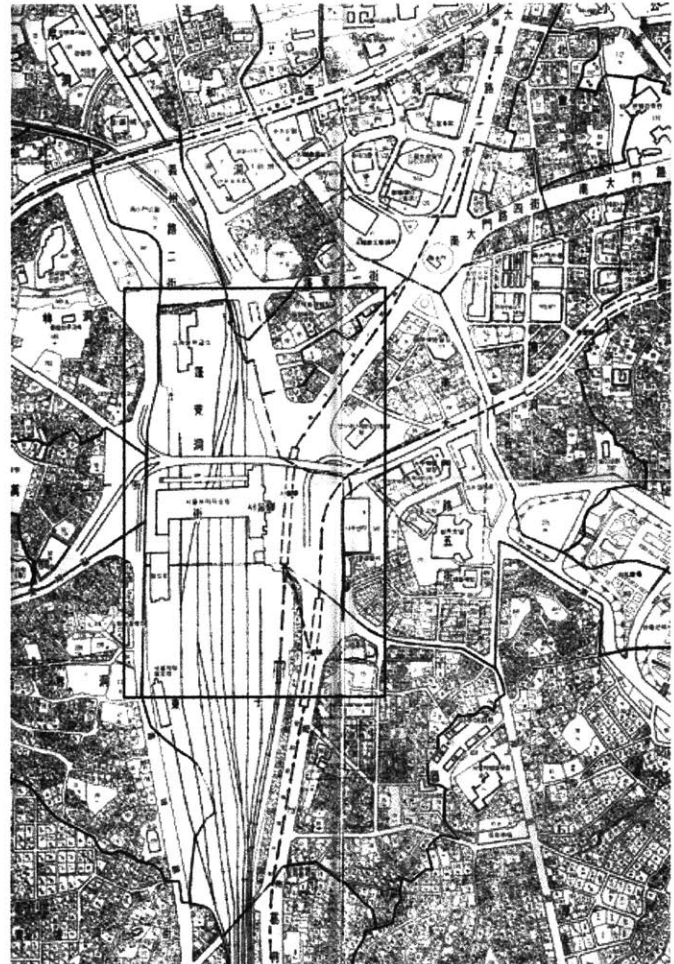
Aerial view of Seoul station and surroundings

**[modes]**

of transport are expanding and with the vigorous growth of the city, travelling is becoming more complex. Demand to reach further out of the city center, requires more ordered information to comprehend the heavily integrated routes. The automobile is typically favored for the reasons of speed and personal control, however with growing congestion people are returning to public transportation. There is constant research undertaken to face the demands of speed and high efficiency. Presently there are other modes such as underground light rail transport -subways- that operate efficiently within the city and with little interference to other transport machines.

[**boundary**]

is an issue when the needs of the public begin to extend beyond the city limits. Where is the "gate" of the city? Our notions of terminals are changing, with various approaches made to activate life at the terminal, to eliminate the senseless waiting and to celebrate arrival and departure. Constructing a main terminal which connects to other cities and to another important terminal - the airport - which in turn connects to the world, will have a major impact on urban trends. Transportation has to be redefined to mean more than efficient machinery, it is a vehicle for improving city life.



Map from Seoul Metropolitan Urban Planning Bureau
bracketed area - site plan drawing limits

revitalize the public realm through infrastructure

definition

{ definition }

.21

Paths are channels along which an observer customarily, occasionally or potentially move through. People observe the city while moving through and along these paths. Other environmental elements are arranged according to their relationship to these paths. <Lynch, Kevin, 'Image of a City'>

Nodes are strategic areas in a city into which an observer can enter - which are the intensive foci to and from which he is travelling. These areas are primarily junctions, places of break in transportation, a crossing or convergence of paths, moments of shift from one structure to another.<Lynch, Kevin, 'Image of a City'>

Kevin Lynch refers to paths, edges, districts, nodes and landmarks as the main contents of a city's image. These elements are co-dependent and determine the character of a city. The concept of node is related to the concept of the path - since junctions are typically the convergence of paths, events in journey. If there are more than one path, the intersection - node - becomes vital since it is a "point of decision", requiring heightened attention. These nodes become part of the city's infrastructure and there is a need to integrate the overall structure into the fabric of the city.

core is the central processor/heart of the building. It is equivalent to the main processor on a microchip. The main unit sits in the chip panel, connected to all the smaller elements, controlling the signals transmitted to each element. The core controls the building and allows it to “breathe”

nerves are the sensors in the buildings that emit information -such as temperature condition, brightness of its location, to the core. They are also able to receive information. A scenario would be, if they alerted the core that the temperature in that area was above the desired level, the core would activate the HVAC system to cool the area surrounding the nerve. Building systems are specialized and monitored through this nervous system by the core/main control unit. Nerves are made of fiber optics for its minimal size and high volume efficiency.

emitters are the elements that exist throughout the building, with a specific duty. Examples are the LCD panels displaying information, the big media screens, schedule listings – all controlled from the core.

plasma monitors are able to make media viewable on flat, thin screens. The traditional CRT system can be discarded and replaced by this emerging technology. its manufacture is composed of a sequence of intricate layering of electronic devices. These are able to support television broadcasting.

lcd panels , liquid crystal display panels, are able to receive the transmission from the core and display train, bus, subway schedules and other related information as well as advertisements and up-to-date information – stock quotes, headline news.

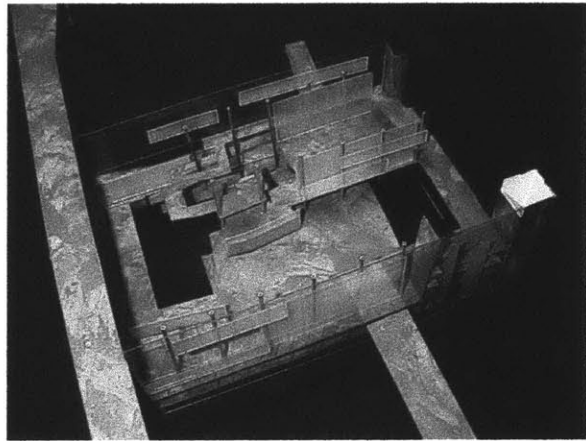
space is perceived as being something that can be created and modified, not a static picture of being, but a dynamic picture of becoming and unfolding.

skin is the layer closest to the human experience. an informative skin is wrapped throughout a space to bombard the user with information and offer a choice of which information to extract.

parameters

```
{ parameters }
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.24



```
[ program ]
```

```
“core” cpu ...150
      ticketing booths ...300
      café ...500
      search stations<internet> ...200
      live news wires ...300
      circulation ...2000
      travel service :personal city tour guide ...800
      <reservation handler : advanced hotel, car>
      conference rooms ...250

< total ...4500 m^2 >
```


//

insights

proffered by Buckminster Fuller between 1932-39, from his 'organic concept of building', had included the ability to modify, update and reorganize building elements to reflect technological obsolescence, changes in building usage or fluctuating external influences. The conception of '*an architecture of continuous technological evolution*' in which functional changes in usage, technical obsolescence and flexible organization could be accommodated, is evident in Yona Friedman's 1958 proposal for a 'Mobile Architecture', which concerned the provision of a continuous and 'flexible' space enclosure and the provision of temporary constructions rearranged periodically according to necessity. Therefore program is not a rigid guideline that will should be maintained, it is one that should be constantly evolving to provide variety and convenience. The suggested program is a rough outline that was used to envision the usage of this building.

//

usage

of this building can be summarized by its role, a new wing of Seoul Station, which currently serves xxxxxx people per month. The majority of the people using the station are train passengers, arriving or departing Seoul. People *interchange* at this station from the subway, bus, car or taxi. They are all funneled into the station and up into the overpass complex built in the mid 80s. The complex hovers over the railway tracks and consists of two levels : main level of ticketing - waiting sections and upper-level shopping arcade. Much of the activity around the station occurs spread apart and with no viable connections between the passengers and their entry into this metropolis.

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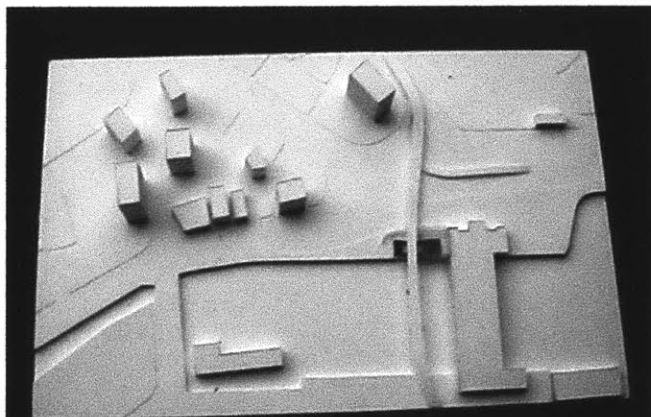
concepts

of transportation are transforming as we enter the new century. With digital technology widely accessible, communications can be achieved in many different ways. The role of transportation has changed. There are various modes that offer different experiences. The traveler needs to be informed of what his choices are. The interchange is where there is constant movement and exchange. It is through control of movement through space that efficient operation can be achieved. Information can be used to organize and control people movement, making a key element in designing for travel, the availability of information that is comprehensible to those unversed in the same language.

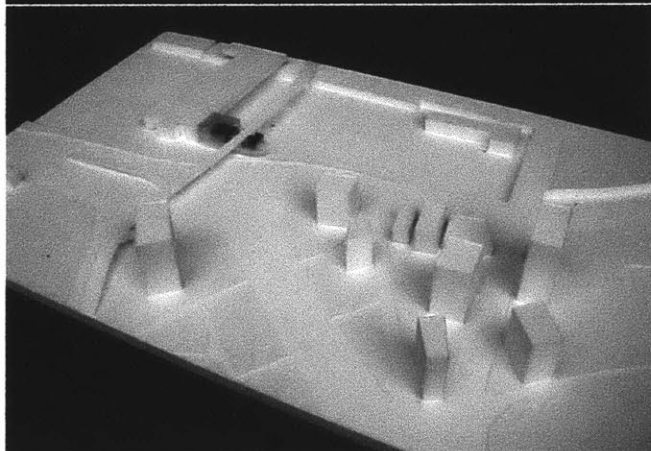
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focus

of this thesis was to design a place of movement and engagement. The building needs to exhibit a dual function: departure - a means to move people to their destination beyond the boundary of the edifice and arrival - a means to engage through new information. The experience of departing or arriving in this exchange differs by the willingness of the traveler to be absorbed by the informative skins.



Site model



The balance between substance and process, materiality and transport is at the core of the architecture of interchange.

design process

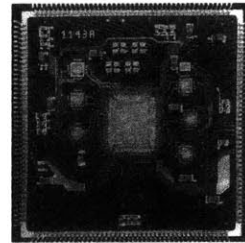
{ design process }

.30

to contrast the heavy load bearing brick building, I have designed the new wing for light spatial and visual qualities.



Similar to a layered microchip production process - temperature, conductivity, and light-sensitivity determines the order and format the format of a microchip - the building was formulated with a system of layering. Layers of information are added to a simple rectangular 50m by 35m layout to create levels of varying human movement. The initial concept was a glass box <luminancy to display information at all angles> attached to the historic brick structure. However the dual conditions that are allowed in this new culmination of information display materials to replace conventional architectural elements raised issues of lighting and temperature control. To display information transparency and openness is required but the actual physical elements that display information - lcd's and plasma screens - require lighting contrast, darkness, to have full effect. Temperature is controlled by the outer skin of the building - solar control glass panel system. Light is filtered out by the use of layers and semi-reflective outer glass panels. The outer glass curtain walls <facing east and west> are double paned glass panels with the outer layer being solar control glass and the inner layer being light sensitive glass. The light sensitive glass adjusts its reflective capacities depending on the amount of light shining on its surface. This leaves the inside environment to always be of a certain light and temperature condition - physical properties determined by the core CPU.

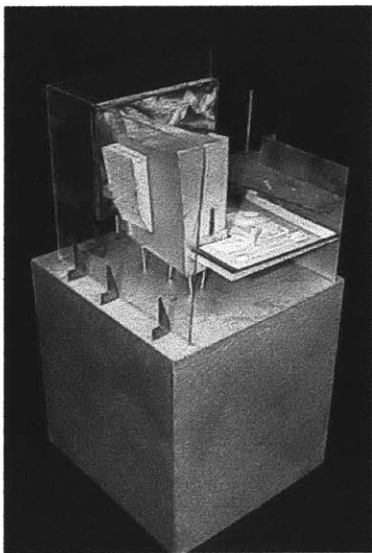


generic microchip

the next layer....encapsulates a region of involvement at an intimate level: cafe, conference rooms, lounges, information/online-banking booths, search stations, and the control tower are found in this layered zone.

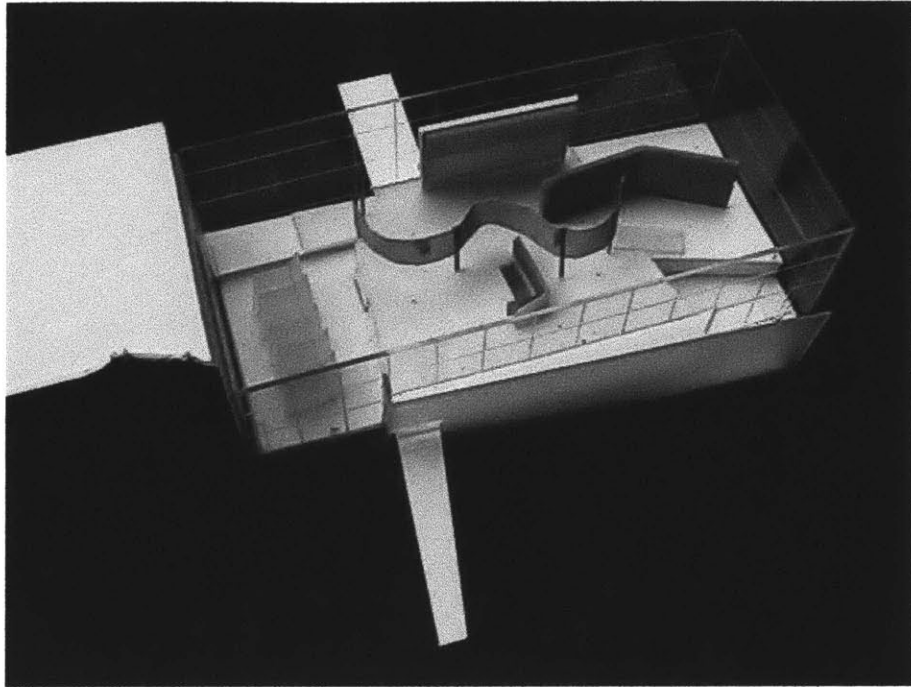
information is catered to meet the needs of an individualistic population.

the third <last> layer....defines a zone which refers back to the traditional train station model - large open space with train schedule information and advertisements along the periphery. this large space is where the four ports converge: train entrance, bus/taxi entrance, building entrance, pedestrian bridge entrance (that ultimately leads to a parking lot).

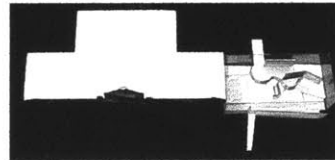


Study model
....core body attachment with information texture....





conceptual model
.... glass box of informative skin



The cybernetic concept of an 'intelligent' building may be perceived as a dynamic assemblage of components, which could not be understood in isolation to the whole system. The organization of relationships of parts, including those components which are in themselves intelligent - human activity - would be the pattern through which the building's processes could be revealed.

Experiencing the liquidization of the world, of our language, of our gender, of our bodies: a situation where everything becomes mediated, where all matter and space are fused with their representations in media, where all form is fused with information. We are shifting from matter to substance, from solidity to grain and resolution. The liquid in architecture has previously been associated with the easing back of architecture for human needs, of real-time fulfillment. But this soft and smart technology of desire can only end up with the body as a residue, where its first steps in cyberspace will probably be its last steps altogether.



roof system

is automated, and set to be responsive to the light conditions on both sides - inside and outside. The louvres operate in pairs, and has three states of conditions - closed, semi-closed and open. This automated roof system hovers over the main hall to enhance visibility of the information on the large electronic displays.

nerve lines

mullions of the glass curtain wall are embedded with fiber optic sensors, to control the amount of solar energy that is entering the building. the outside glass panels are solar-control glass, columns are embedded with fiber optic sensors which monitor the air quality, temperature and light conditions.

lcd panels

service the public by displaying information that is characteristic of a train station. The information ranges from bus/train schedule information to music videos, advertisements.

Introduction of building elements that not just take its place in the building but interacts with its surroundings, becoming the mechanical limbs of the building.....mechanics

plasma monitors

are television-alternatives, placed to create a live interactive environment. it wraps the cafe area where music video channels and television broadcasting can be viewed.

sound blocking cubicles

are responsive to the pressing issues created by the increasing presence of cellular communication. noise control is the main issue and sound proofing can be one solution. Cubicles are designed to only activate during occupation, and subsequently would avoid spillage and seepage of sound.

increasingly becoming that machines are a form
of living being, not a separate entity; and by
the same token, that a living being is
undoubtedly a form of machine

presentation

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{ presentation }
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.38

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line drawings: plans | sections | perspectives
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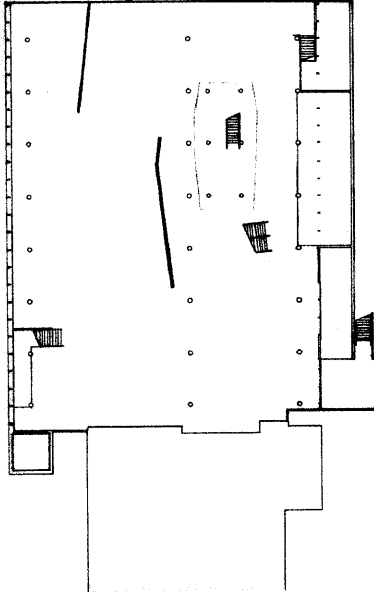
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models: final | preliminary
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digital model: renderings
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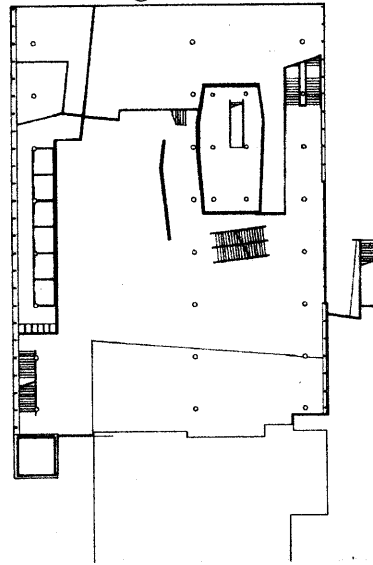
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LEVEL5	administration connection to main
headquarters <private>	
LEVEL4	cafe
	conference brackets
LEVEL3	VIP lounge
	bus, train ticketing station
LEVEL2	information outlets
	travel services
LEVEL1	search stations
	live news wires
	subway exit.
<public>	

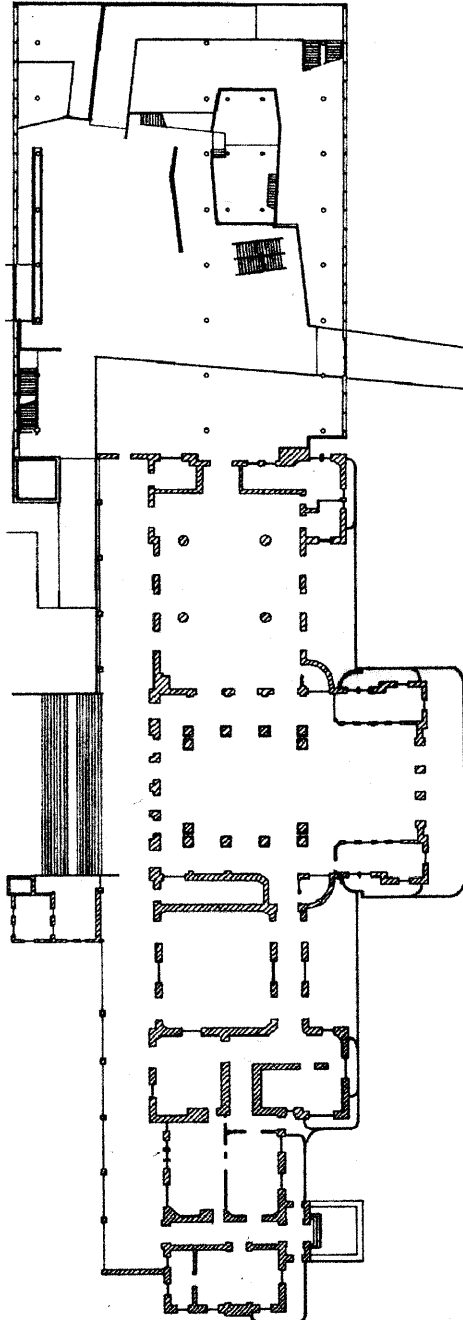
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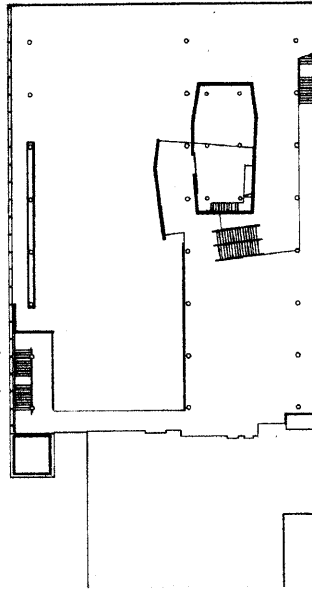
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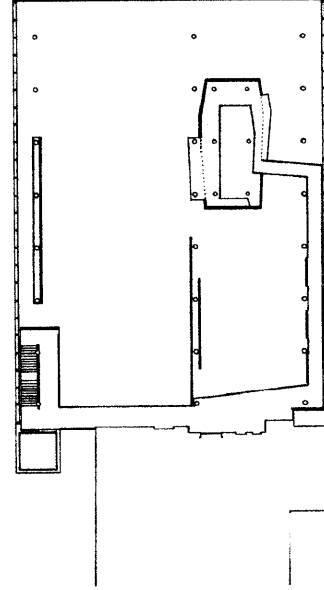
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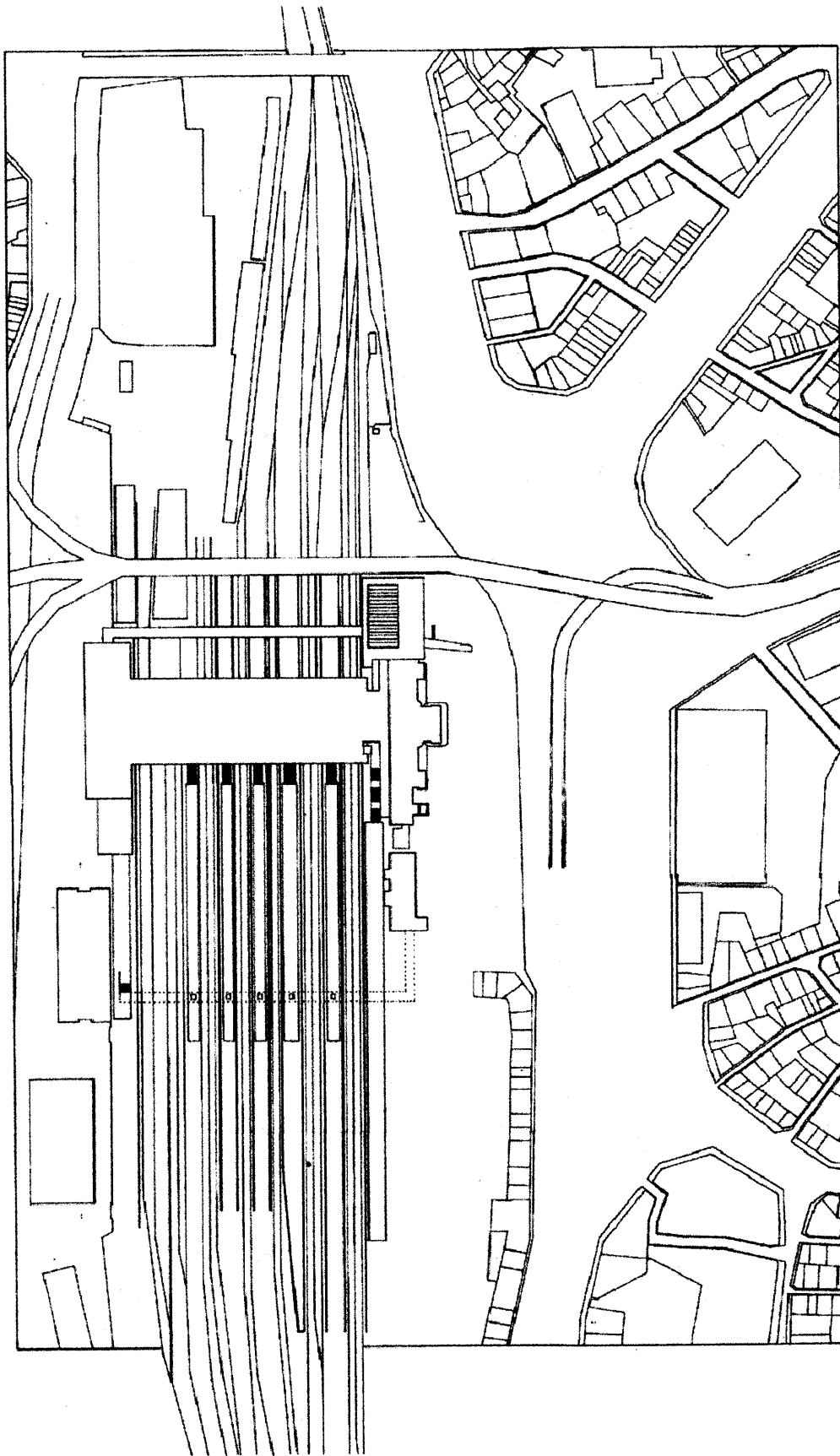


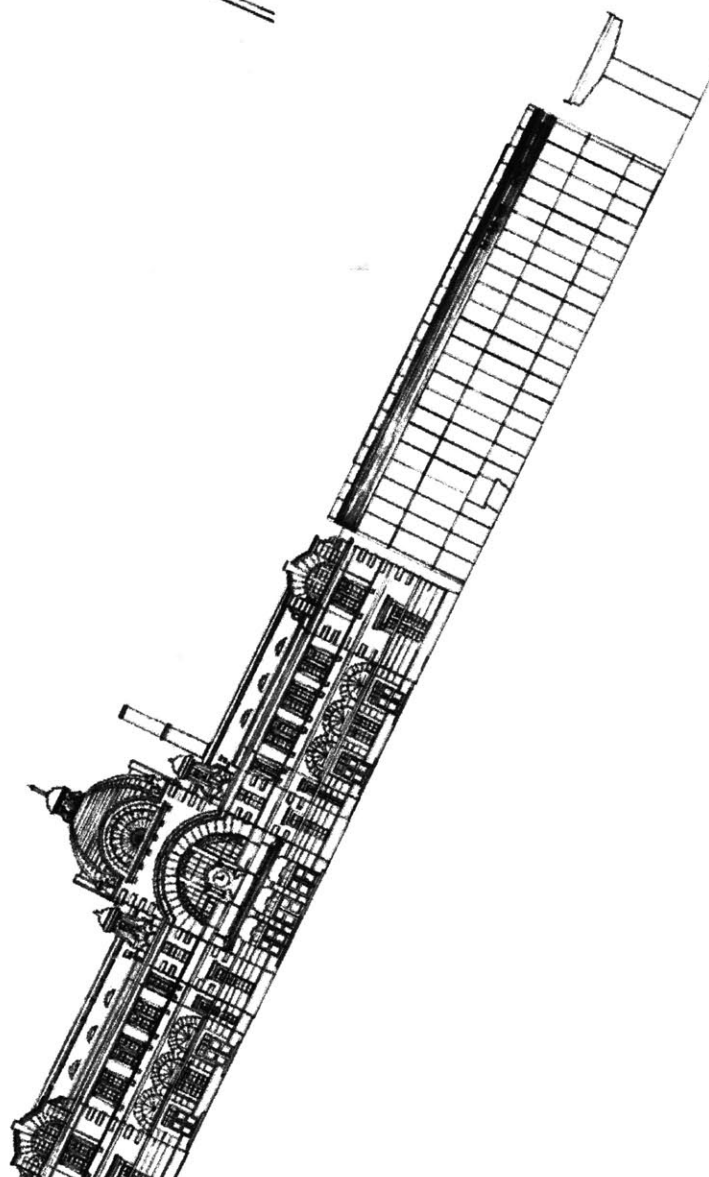
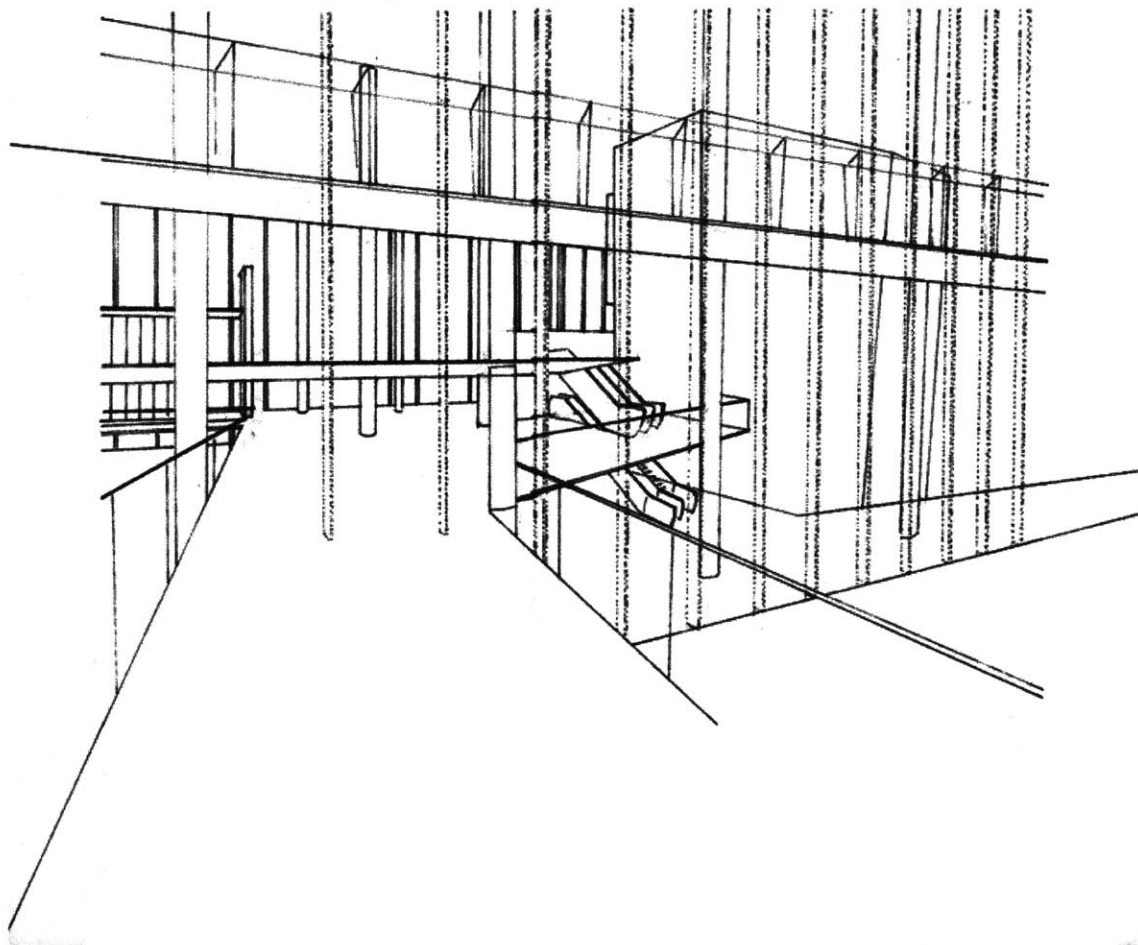
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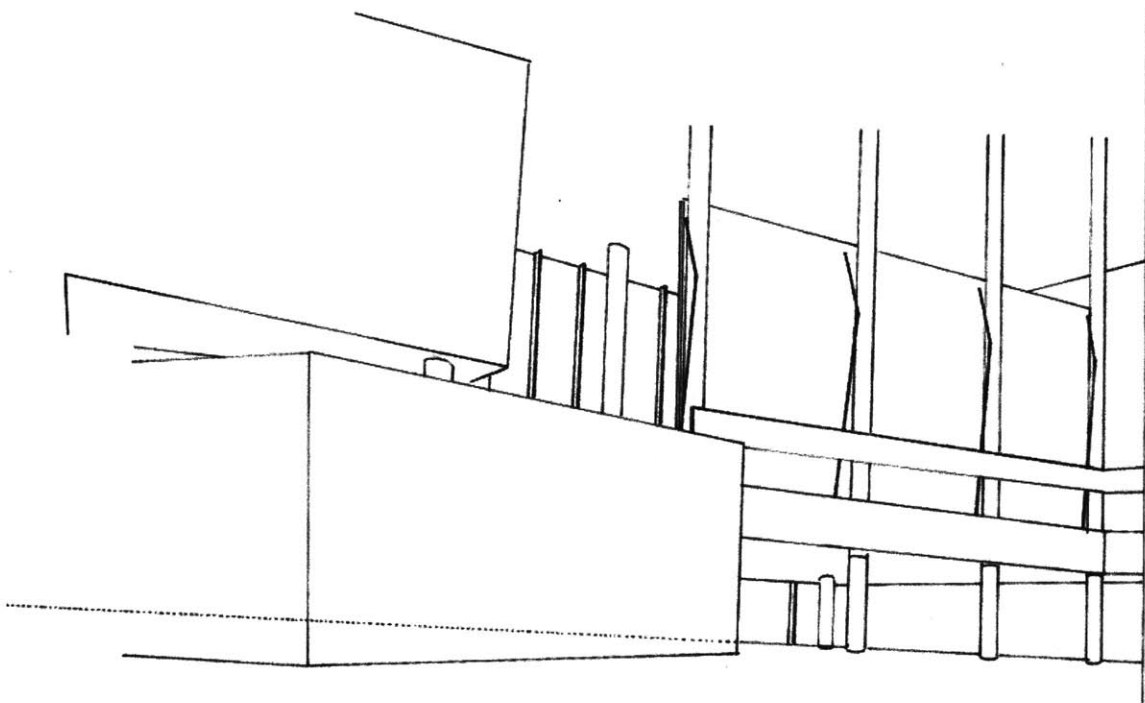
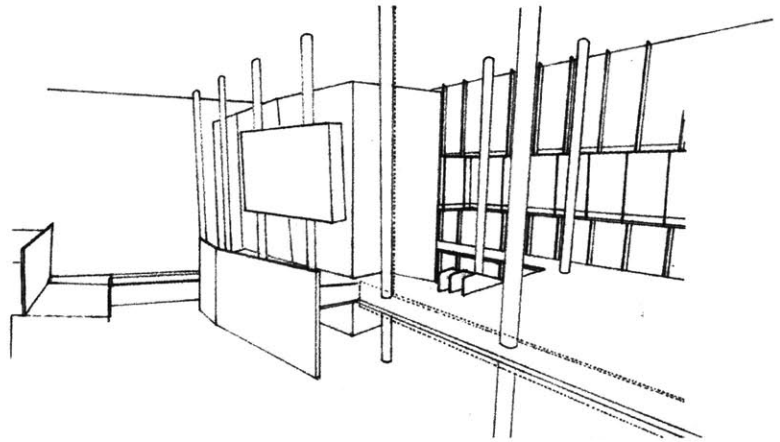


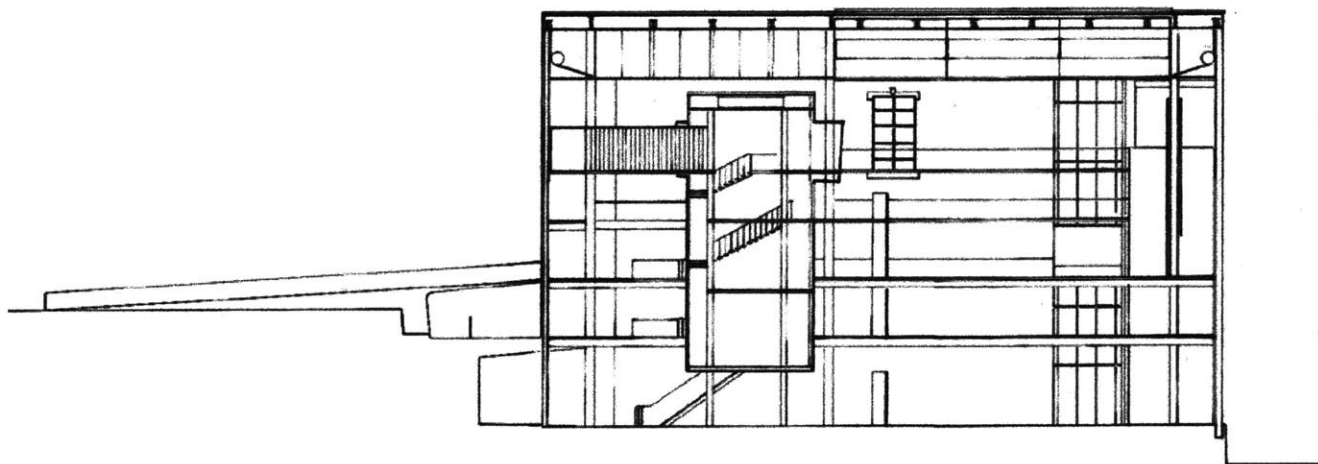
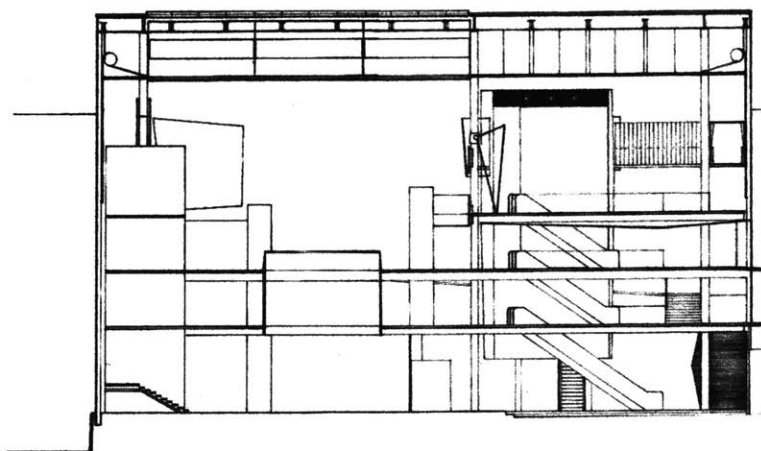
Level 5 @ +7.5m

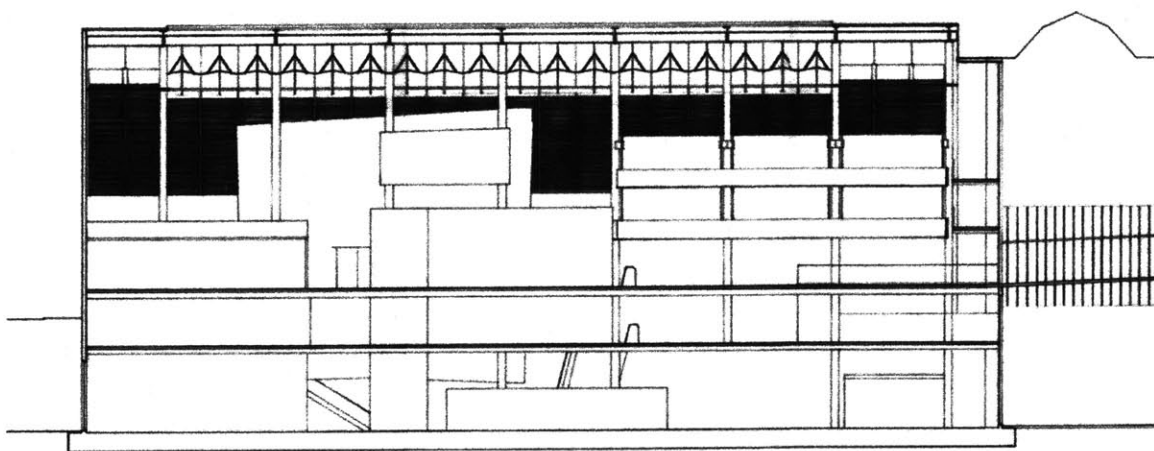
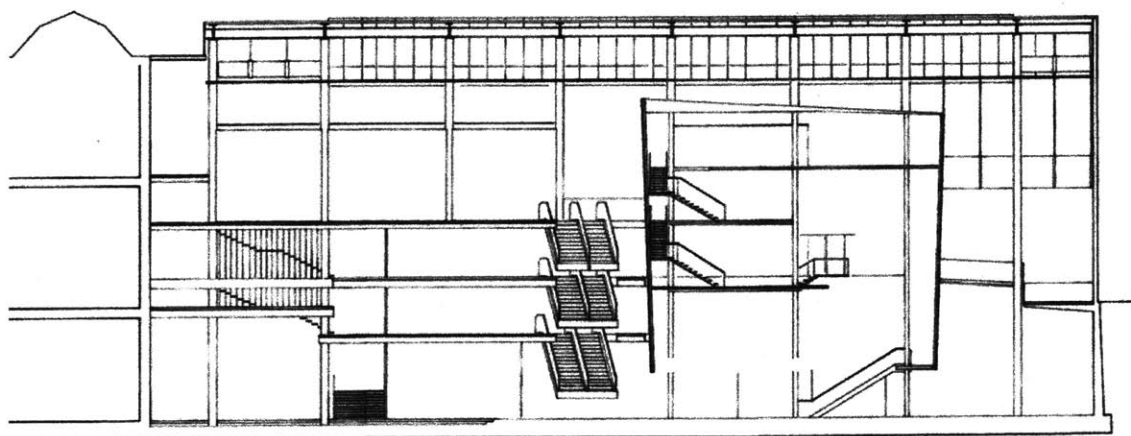














L5

L4

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